Hydrogen East

H2 News Hub

Issue 18

H2 East

May 2022

Top stories

Welcome to issue 18 of **Hydrogen East**'s Sector Review, where we take a look at important publications and developments over the month of April (2022).

April saw the UK government unveil its **Energy Security Strategy**, targeting a "major acceleration" in homegrown power to boost long-term energy independence, security and prosperity against the backdrop of rising global energy prices and Russia's invasion of Ukraine.

McKinsey released its **Global Energy Perspective 2022** in which it tipped the global energy mix to shift towards power and hydrogen, suggesting that by 2050, electricity and enabling hydrogen and synfuels could account for 50% of the mix. Hydrogen demand is forecast to grow fivefold by 2050, with road transport, maritime and aviation the key drivers.

Elsewhere, in light of hydrogen market developments and the **REPowerEU** plan, the **European Hydrogen Backbone initiative** unveiled an updated, extended, accelerated vision, involving 31 energy infrastructure companies from 28 countries. The updated network would see five pan-European hydrogen supply and import corridors emerging by 2030, connecting industrial clusters, ports and hydrogen valleys to regions of abundant hydrogen supply.

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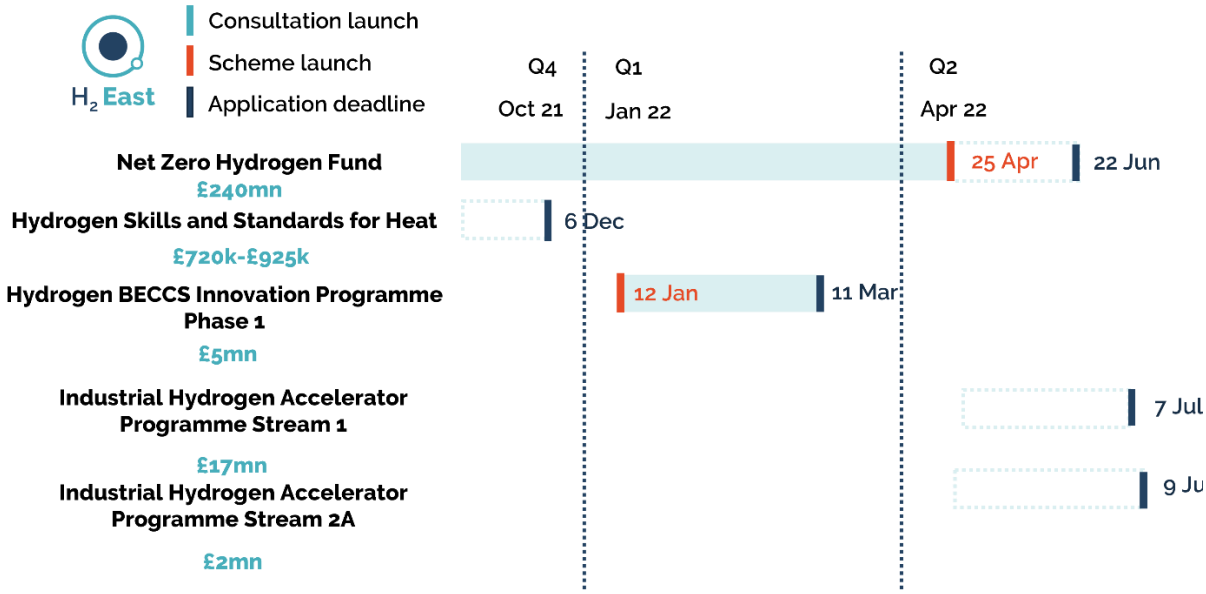
Upcoming webinars

5 May – **RenewableUK:** Green Hydrogen 2022 | **9 May** – **BEIS:** Industrial Hydrogen Accelerator Programme – Launch & Networking | **10 May** – **Baker Botts & UK HFCA:** Hydrogen Policy Update | **12 May** – **edie:** Embracing hydrogen on the road to net zero | **12 May** – **SWM:** Decarbonising our energy system with hydrogen | **17 May** – **Department for International Trade:** Regional Hydrogen webinar | **31 May** – **RCS:** Hydrogen – planning for industry decarbonisation in the Humber Cluster

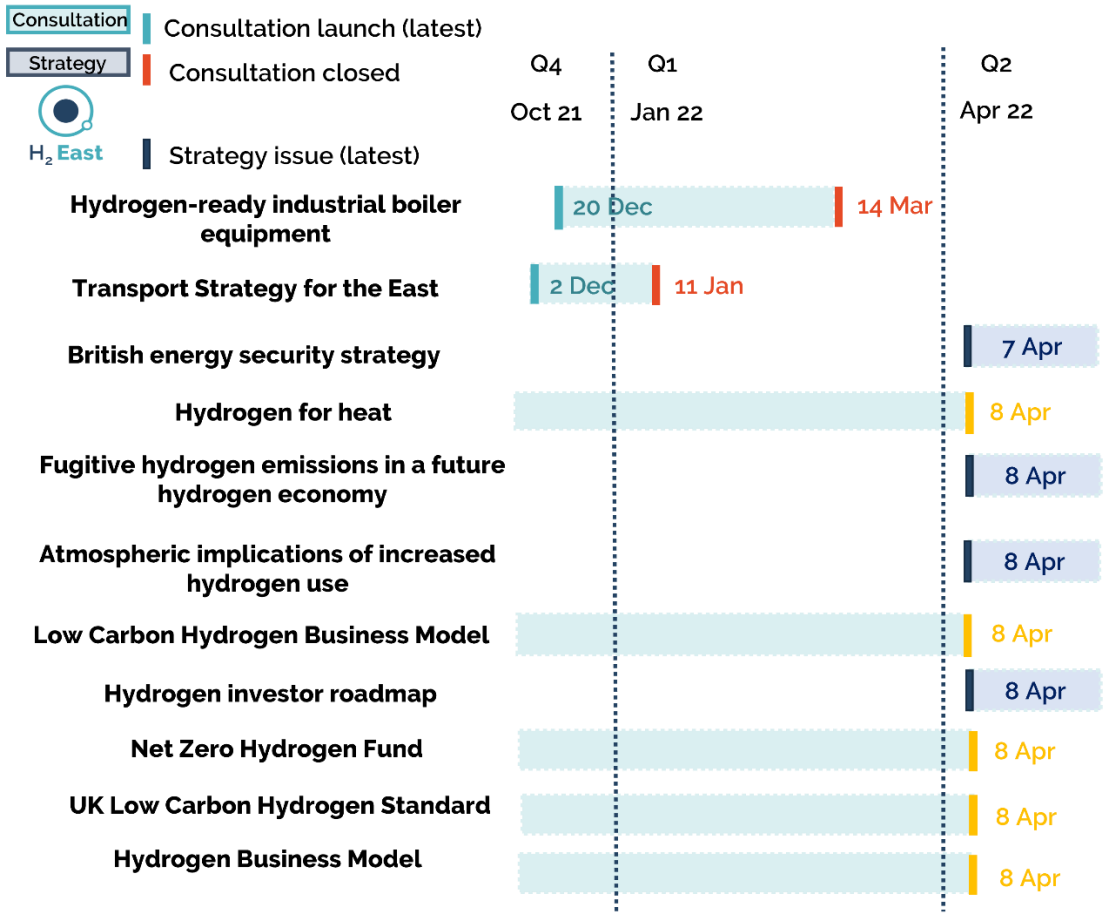
Funding tracker

There are a number of funds already available for developers, local authorities and innovative organisations. These cover both feasibility studies and demonstrator projects.



Policy tracker

A number of consultations and strategies are in development and are expected to be issued in 2022. Government has opened a number of consultations, outlined below.



UK doubles hydrogen ambition in energy security strategy

The government has unveiled ambitions for up to 10GW of low carbon hydrogen production capacity by 2030 as part of its plan for energy independence.

Figure 1: The government's key hydrogen measures in brief

(Source: BEIS)

Key measures

- Double our ambition to up to 10GW hydrogen production capacity, at least 50% from electrolytic projects
- Aim to run annual allocation rounds for the hydrogen business model, moving to price-competitive allocation by 2025 as soon as legislation and market conditions allow
- Aim that up to 1GW of electrolytic hydrogen is in operation or construction by 2025, alongside our existing commitment up to 1GW of CCUS-enabled hydrogen
- Design Transport & Storage business models by 2025

On 7 April, it published its Energy Security Strategy, targeting a "major acceleration" in homegrown power to boost long-term energy independence, security and prosperity in light of rising global energy prices, driven by surging demand after the easing of pandemic restrictions and further exacerbated by Russia's invasion of Ukraine and subsequent fallout. According to the government, its plan could see 95% of Britain's electricity be low carbon by 2030 and support 40,000 more jobs in clean industries.

To do this, it is proposing 24GW of nuclear power by 2050, representing 25% of projected electricity demand, as well as 50GW of offshore wind by 2030, with 5GW from floating offshore wind, along with planning reforms to cut approval times from four years to one year as part of measures to streamline the process of getting new offshore wind online.

It also is planning a new licensing round for North Sea oil and gas projects in the autumn, along with a new taskforce to provide bespoke support to these developments; to consult on developing partnerships with a limited number of supportive communities who want to host onshore wind; and to grow the UK's solar capacity (14GW) five times by 2035.

As for hydrogen, the goal is to double ambition for low carbon hydrogen production capacity to 10GW by 2030, with at least half coming from electrolytic hydrogen. Investment in the North Sea, renewables and nuclear through the strategy mean the UK will be well-placed to exploit all forms of low carbon hydrogen production, with the government earmarking green hydrogen in particular as especially viable for flexibility and as a storage solution. Excess renewable electricity used to produce it could be stored over time and then used to power the grid, as and when it is needed.

It will aim to run annual allocation rounds for electrolytic hydrogen, before then moving to price competitive allocation by 2025, as soon as legislation and market conditions allow, ensuring that up to 1GW of electrolytic hydrogen is either in construction or operational by 2025. It will also design new business models for hydrogen transport and storage infrastructure by 2025, something that will be essential in growing the hydrogen economy and look to level the playing field by setting up a hydrogen certification scheme in 2025. This will demonstrate high-grade British hydrogen for export, while ensuring that any imported hydrogen meets the same high standards that UK companies expect.

Reacting to the strategy, CEO of Hydrogen UK, Clare Jackson, said the new 10GW target would allow industry to "unleash investment, bring down costs and widen the use-case for hydrogen, exploring its potential in transport, heavy industry and to heat homes".

Low Carbon Hydrogen Standard sets guidance for hydrogen producers

The government has issued guidance for hydrogen producers on greenhouse gas emissions reporting and sustainability criteria under a new UK Low Carbon Hydrogen Standard.

On 8 April, BEIS published the Low Carbon Hydrogen Standard, setting a maximum threshold for the amount of greenhouse gas emissions allowed in the production process for hydrogen to be considered "low carbon". Complying will help to ensure low carbon hydrogen production directly contributes to the UK's carbon reduction targets. It will require hydrogen producers to meet a greenhouse gas emissions intensity of 20g CO2e/MJLHV of produced hydrogen or less for it to be considered low carbon, as well as to calculate their greenhouse gas emissions up to the point of production.

Further requirements include accounting for the emissions associated with meeting a theoretical minimum pressure level of 3MPa, as well as a theoretical minimum purity of 99.9% by volume at the production plant gate, in the emissions calculations.

Producers will also have to include emissions associated with the capture, compression, transport and storage of CO2 in their emissions calculations; account for the use of electricity, using data to demonstrate that the electrolyser is operating at the same time as the electricity input source; and set out a risk mitigation plan for fugitive hydrogen emissions. This plan should demonstrate how fugitive hydrogen emissions at the production plant will be minimised, provide estimates of expected rates of remaining fugitive hydrogen emissions by the plant, and prepare a monitoring methodology.

It also requires producers to meet additional requirements for the use of biogenic inputs, where relevant and as appropriate for the feedstock source and classification, demonstrating compliance with the land, soil carbon and forest criteria; satisfy the minimum waste and residue requirement; and report on estimated indirect land-use change greenhouse gas emissions.

McDermott joins Norfolk hydrogen hub project

McDermott International has linked up with a group of industry experts focused on unlocking the potential for a hydrogen-led energy hub in Bacton.

On 26 April, McDermott announced that it has been selected as a core member of the Infrastructure Special Interest Group (SIG) – one of five established by the North Sea Transition Authority (NSTA) as the project develops. The Infrastructure SIG will establish the offshore and onshore facilities necessary for producing, storing and distributing both low carbon and renewable hydrogen, and associated CCUS. It will include industry and government input as it performs a series of studies and makes recommendations for future project development and look to enable industry to take investment decisions by 2024.

McDermott, specifically, will lead Work Scope 6 – Greenfield Onshore facilities as part of the Infrastructure SIG. The other SIGs established by the NSTA are Hydrogen Supply, Hydrogen Demand, Regulatory, and Supply Chain and Technology.

The Bacton Energy Hub project, which is being spearheaded by the NSTA, will aim to play a significant role in the UK's energy future and prove vital in the transition to net zero. It will look to deliver a sustainable hydrogen supply through adding facilities that support low carbon hydrogen production, as well as carbon capture and underground storage by 2030. It will also aim to develop renewable hydrogen production as part of the energy supply transition by 2050 through development of offshore wind.

Study set to explore role for hydrogen in driving London to net zero

Britain's largest gas network companies are set to collaborate on a project that will explore the role hydrogen could play in helping London to net zero by 2030.

On 22 April, Cadent, SGN and National Grid Transmission announced that they will design a hydrogen vision for London, setting out the potential benefits and opportunities it would bring, which could include reduced emissions, jobs and skills, future energy independence, and greater comfort for London's citizens.

As a first step for the Capital Hydrogen programme, which will consist of a series of projects lasting 15-20 years, they will deliver a feasibility study for the transition of London's gas network to hydrogen. This research will conclude in October 2022, with the energy companies working collaboratively to gather views from key stakeholders over the next six months.

This study will look at how much hydrogen London could need over the next 30 years, as well as where it will be produced, stored and transport to where it is needed. It will explore how the gas grid can play a role in the distribution of hydrogen, both through blending in the existing network, as well as working towards the delivery of 100% hydrogen through dedicated infrastructure.

It highlighted the Thames Estuary as having potential for low carbon hydrogen production and use, while added that the identification of hydrogen demand in London will also help stimulate production in nascent energy hubs, including those in Southampton and Bacton, with the feasibility study to look at how gas networks can help to connect production and demand.

Net Zero Hydrogen Fund opens up for applications

The government is now inviting applications for its Net Zero Hydrogen Fund (NZHF).

On 25 April, Strand 1 and 2 of the £240mn NZHF opened for applications, with the fund striving to provide capital expenditure (CAPEX) and development expenditure (DEVEX) to support the commercial deployment of new low carbon hydrogen production projects during the 2020s. This will help the UK to deliver on its 10GW of low carbon hydrogen production by 2030, ahead of reaching net zero by 2050.

Through Strand 1, development expenditure support will be provided for front end engineering design (FEED) and post-FEED studies to grow the future pipeline of hydrogen projects in the UK. Proposals, to be successful, must demonstrate how they will develop a credible project that will contribute to the at-scale production of low carbon hydrogen by 2025, with funded projects needing to support delivery to the 2030 hydrogen goal. Grant requests must be between £80,000 to £15mn, with the deadline 11AM on 22 June.

In Strand 2, CAPEX will be provided for projects that do not require a hydrogen specific business model. These will be low carbon hydrogen projects that can deploy on the basis of capital expenditure support and can start construction rapidly. The total grant request here can be between £200,000 and £30mn, with the deadline 11AM on 6 July.

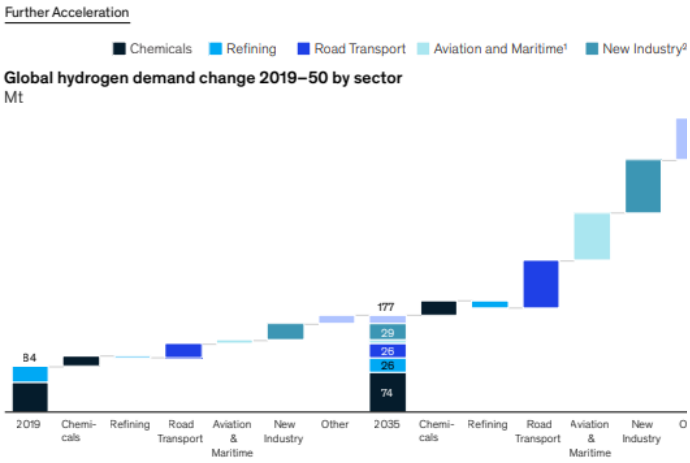
The government did acknowledge that some projects may be considering revenue support through both Hydrogen Business Model and Renewable Transport Fuel Obligation. Subject to compliance with subsidy control principles, it plans to develop arrangements that can support dual participation in both schemes. Projects would not, however, be allowed to claim both sources of funding for the same volumes of hydrogen.

Global energy mix to shift rapidly to power and hydrogen

The global energy mix is set to shift rapidly towards power and hydrogen, with these reaching a share of 50% in final consumption by 2050, according to a report.

Figure 2: Global hydrogen demand change 2019-50 by sector

(Source: McKinsey)



On 26 April, McKinsey published its *Global Energy Perspective 2022*, seeking to offer insights into longer term trends that will prove crucial in shaping future energy systems.

It set out how the economic rebound for Covid-19 and war in Ukraine has seen price spikes for multiple commodities, along with increasing energy prices and security-of-supply concerns. Despite this, the transition to a lower carbon energy system is continuing, accelerating and set to see a rapidly changing energy landscape in the coming decades.

Specifically, it is forecasting the energy mix to undergo a rapid shift towards power, synfuels and hydrogen, with these representing 32% of the global energy mix in 2035 and 50% by 2050. Hydrogen demand will grow fivefold by 2050, with road transport, maritime and aviation set to be primary drivers.

Up to 2035, growth will be driven by sectors with favourable economics, such as road transport where fuel cell electric vehicles (FCEVs) will, in all likelihood, displace conventional diesel trucks. After 2035, private and public sector commitments could drive the adoption of hydrogen in sectors with unfavourable economics, including the likes of aviation and maritime.

Supply is to shift from almost 100% grey hydrogen to 60% clean production by 2035, rising to 95% come 2050. This will be driven by declining costs and policymakers supporting hydrogen technology adoption. Through McKinsey's further acceleration scenario, it found clean hydrogen supply to total around 110Mt by 2035 and 510Mt by 2050. Regions projected to fully phase out grey hydrogen by 2050, including the UK and the EU. Hydrogen is also set to add around 18,000TWh of electricity consumption and around 300bcm to natural gas demand.

It went on to identify three enablers considered fundamental to supporting the development of the hydrogen economy, including how timely deployment of infrastructure across the whole supply chain is key to meeting hydrogen demand, while cost reduction and increased scale-up in renewable energy production, electrolysers and carbon capture, utilisation and storage could be needed to ensure clean technologies are cost competitive against conventional high-carbon production routes.

As for the government's role, targeted actions and support, including a CO_2 price increase, will be crucial to supporting the development of the hydrogen economy. Such moves will be particularly critical in sectors where hydrogen will not be cost competitive compared to the higher carbon alternative, such as in the aviation sector.

Hydrogen bodies urge government to step up support for fuel suppliers

The government has been told to speed up incentives for fuel suppliers that wish to offer hydrogen as a low carbon alternative.

On 13 April, the UK Hydrogen and Fuel Cell Association (UK HFCA) and HyCymru stressed that there are serious concerns delays to government support could impact companies that want to invest in hydrogen as a low carbon fuel. Having recently met to review the hydrogen rollout in the UK, the organisations welcomed extensions to the Renewable Transport Fuel Obligation (RTFO), which now includes hydrogen as a low carbon option for more vehicle types but said more could be done to encourage suppliers.

UK HFCA and HyCymru are calling on the government to act quickly to confirm that electrolytic hydrogen produced remotely from the point of renewable electricity production will be eligible for RTFO certificates. This will help to stimulate demand in the transport sector, as well as complementing government efforts to scale up the supply of hydrogen and reduce overall risk around the growth of hydrogen in the energy system.

Aviation experts to make zero emission flight a reality

Aviation experts across industry and government are to form a new group, working together to make planes running on batteries and hydrogen a reality.

Launched on 20 April, the Zero Emission Flight (ZEF) Delivery Group will sit under the Jet Zero Council and strive to position the UK at the forefront of the global shift to green aviation through supporting zero emission aircraft and airport infrastructure. The group will also look at how the law needs to adapt so that sustainable flying can become a reality, as well as catapulting the latest innovations in aviation decarbonisation technology.

Current Chief Operating Officer of the Connected Places Catapult, Rachel Gardner-Poole will lead the group, bringing with her over 20 years-experience in military and commercial aviation through the Civil Aviation Authority, UK Space Agency and IBM. Gardner-Poole will lead the ZEF Delivery Group as they build on progress made through the Department for Transport's Zero Emission Flight Infrastructure project, and Aerospace Technology Institute's FlyZero project.

The FlyZero report, released in March, determined hydrogen, stored in a liquid state, as offering the best opportunity to eliminate aircraft tailpipe CO2 emissions. It found hydrogen-powered mid-size aircraft entering into service from 2033, along with other variants progressively joining them over the next decade, could see a cumulative global saving of more than 4Gt of CO2 by 2050, rising to 14Gt by 2060.

Ireland set for its first Hydrogen Valley

A consortium is set to deliver Ireland's first Hydrogen Valley.

On 14 April, SSE Renewables announced that the Galway Hydrogen Hub (GH2) consortium is proposing to develop a Hydrogen Valley, providing green hydrogen for use in transport, industry and within local communities in the greater Galway region. The consortium is made up of SSE Renewables, NUI Galway, the Port of Galway, CIÉ Group and Bus Éireann, Aran Islands Ferries, Lasta Mara Teo and Aer Arann Islands.

The GH2 consortium will develop an initial flagship demonstrator project at Galway Harbour for the indigenous production and supply of clean green hydrogen fuel for public and private vehicles. This will be a multi-modal, zero emission renewable hydrogen transport hub that can be easily replicated across Ireland.

It is expected to be fully operational by the second half of 2024.

Clear Hydrogen UK aims to produce 5mn kg of hydrogen per day

Clear Hydrogen UK (CHUK) is set to produce 5mn kg of hydrogen per day after an expansion of its agreement with Proton Technologies.

On 25 April, CHUK signalled its intention to produce clear hydrogen from the UK's aging offshore oil assets, while also sequestering vast amounts of CO2 as solid carbonate within the same systems, using Proton's low-cost and environmentally method for making hydrogen. CHUK's founders invested $3.7mn CAD in Proton to obtain a 20 tonne per day production license for use in the UK and Ireland.

The expansion of the agreement is 250 times larger, with a value potentially as high as $925mn CAD for 5,000 tonnes per day.

First Hydrogen target four green hydrogen sites in the UK

First Hydrogen has identified four industrial sites in the UK as part of its drive to develop green hydrogen production projects.

On 11 April, it announced that it is now advancing discussions with landowners to secure land rights, while it is working with engineering consultants Arup for engineering studies and designs. All the sites are in prime industrial areas, spread strategically across the North and South of the UK, with each to accommodate a large refuelling station for light, medium and heavy commercial vehicles with on-site hydrogen production, and a larger hydrogen production site of between 20-40MW, for a total for the four sites of between 80-160MW.

According to First Hydrogen, it is expected that the target sites will qualify for the financial support from the UK government, both for development and construction phases, delivering capacity to support the 10GW hydrogen production ambition.

Once the production facilities are built, they will serve customers of First Hydrogen's automotive division, with its green hydrogen van due to begin demonstrator testing in June, before final delivery for road use in September 2022. First Hydrogen is looking to secure a domestic supply of fixed-price long-term green hydrogen fuel and distribution arrangements with these customers. This will form part of its offering to fleet operators of a full hydrogen mobility service for light commercial vehicles, as well as supplying its mobile hydrogen refuelling stations with green hydrogen.

Shell and Uniper plot UK blue hydrogen facility

Uniper and Shell are set to work together on a blue hydrogen production facility in the UK.

On 12 April, Shell announced that it had signed an agreement with Uniper, progressing plans to produce blue hydrogen at Uniper's Killingholme power station in the East of England. The hydrogen produced could then be used to decarbonise industry, transport and power throughout the Humber region.

Under the plans, the Humber Hub Blue project would have a capacity of up to 720MW and use gas reformation technology with carbon capture and storage (CCS), capturing around 1.6mn metric tonnes of carbon each year. The carbon captured would be fed into the proposed Zero Carbon Humber onshore pipeline - part of the East Coast Cluster. Shell and Uniper will now jointly progress process design studies and site development activity. The aim is to take the project to front end engineering and design by 2023.

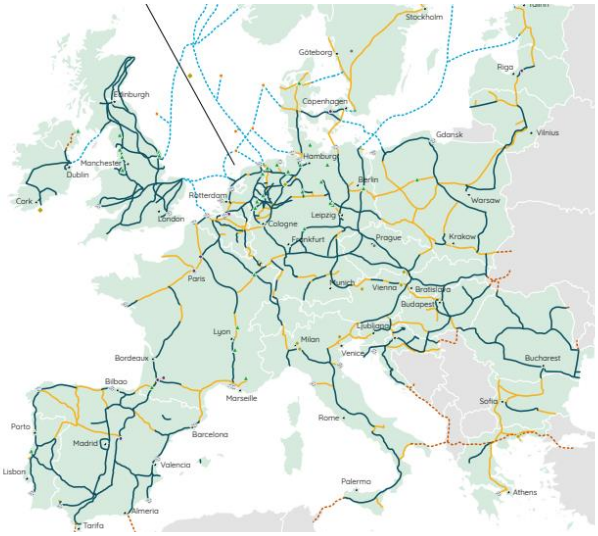
The Humber Hub Blue project has passed the eligibility criteria for the second phase of the government's cluster sequencing process, with successful projects that could be eligible for funding set to be shortlisted from May 2022. Phase-2 projects will take final investment decisions from 2024, before becoming operational from 2027.

Updated vision for European Hydrogen Backbone unveiled

The European Hydrogen Backbone (EHB) initiative has unveiled an updated, extended, accelerated vision in light of the European Commission's REPowerEU plan and developments in the hydrogen market.

Figure 3: The EHB – mature infrastructure, stretching towards all directions by 2040

(Source: EHB initiative)



Published in early April, the vision includes 31 energy infrastructure companies, spanning 28 countries which, by 2030, could see five pan-European hydrogen supply and import corridors emerge, connecting industrial clusters, ports and hydrogen valleys to regions of abundant hydrogen supply, supporting the European Commission's ambition of a 20.6mn tonne of renewable and low carbon hydrogen market.

Growing to become a pan-European network, spanning close to 53,000km by 2040, it would be mainly based on repurposed existing natural gas infrastructure.

Realising such a vision would call for an estimated total investment of around €80-143bn, with this including subsea pipelines and interconnectors to link countries to offshore energy hubs, as well as potential export regions. Transporting hydrogen over 1,000km through the proposed onshore backbone would cost €0.11-0.21 per kg of hydrogen, meaning the EHB is the most cost-effective option for large-scale, long distance hydrogen transport. If hydrogen were to be transported exclusively through subsea pipelines, the cost would be €0.17-0.32 per kg of hydrogen per 1,000km.

It further set out how the EHB presents an opportunity to accelerate the decarbonisation of the energy sector by efficiently integrating substantial volumes of additional renewable and low carbon energy, and by connecting regions with abundant supply potential to centres of demand. It also could revitalise Europe's industrial economy while ensuring energy system resilience, increasing energy independence, and security of supply across Europe.

Therefore, to achieve the European Commission's Fit for 55 and REPowerEU ambitions, as well as fostering an accelerated development of the EHB, the report set out a series of levers to facilitate the implementation of infrastructure projects, including introducing the establishment of import corridors as a political objective in the REPowerEU plan; establishing a more integrated energy system planning of hydrogen, natural gas, and electricity infrastructure at EU and Member State level; and promoting efficient measures to facilitate the swift development of a dedicated hydrogen infrastructure through repurposing existing natural gas infrastructure.

Further levers include simplifying and shortening planning and permitting procedures for renewable energy and hydrogen projects; unlocking financing to fast-track hydrogen infrastructure deployment through leveraging funding mechanisms, including the Connecting Europe Facilitate, Important Projects of Common European Interest, and Horizon Europe funds; and encouraging international cooperating and creating both intra and extra-European energy and hydrogen partnerships.

SSE continues green hydrogen push with new project

SSE Renewables and Siemens Gamesa Renewable Energy have unveiled plans to produce and deliver green hydrogen through electrolysis, using clean power from wind.

On 4 April, SSE announced plans to use renewable energy from its 100MW plus Gordonbush onshore wind farm in the Scottish Highlands to produce green hydrogen. SSE Renewables will use Siemens Gamesa's Renewable Hydrogen Upgrade at the site, which includes an electrolyser and ancillary technology, with the facility capable of producing up to 2.000 tonnes of green hydrogen each year. This could then be used as a clean alternative to petrol, diesel or natural gas to help decarbonise hard-to-abate sectors.

The project follows the companies' agreement last year to explore opportunities to produce green hydrogen on co-located onshore wind farm sites.

The overall development will include a battery energy storage system capable of storing any surplus, or constrained renewable energy that is produced by the wind farm at times of excess wind on the electrical grid. The excess green energy can then be stored in lithium-ion batteries for possible later use, including the potential to power the electrolyser for green hydrogen production, or to dispatch to the national grid when wind is not blowing.

Through the project, SSE Renewables will also work to explore opportunities to unlock the full potential of the green hydrogen value chain in the Scottish Highlands and support Scotland's emerging green hydrogen economy. This will involve working with potential green hydrogen customers from high carbon sectors looking to decarbonise their energy and fuel supplies.

SGN secures funding to deliver hydrogen project

SGN has secured funding to deliver a nationally strategic hydrogen transmission and storage project.

In early April, it announced that it had received £29.9mn from Ofgem and gas distribution companies, allowing it to test the use of high-pressure pipelines for hydrogen transmission and storage as an option for net zero heating. The project, based at Grangemouth in Scotland, will be delivered in partnership with INEOS and seek to determine whether Britain's transmission networks can be repurposed for hydrogen gas.

An aim of the National Hydrogen Programme will be to determine the role of the Local Transmission System, which is the critical infrastructure connecting towns and cities to the National Transmission System, in system transformation and facilitating industrial clusters. SGN's aim is to prepare the gas network for greener alternatives, which could include hydrogen, as Scotland and the UK target net zero by 2045 and 2050 respectively.

A decommissioned pipeline in Grangemouth will be used to test and evidence whether it can adapt to carry pure hydrogen. It is also statistically representative of the GB LTS, therefore offering a blueprint for repurposing all the high-pressure pipelines in Britain's network. SGN's project team will now research, develop, test and evidence the computability with hydrogen of the Grangemouth pipeline in preparation for a first of its kind repurposing trial and demonstration in 2024.

SGN Director of Energy Futures, Gus Mcintosh, said: "Our Local Transmission System is part of the national critical infrastructure that reaches millions of homes and businesses across the UK. So, repurposing it for hydrogen could support a hydrogen system transformation that is least cost and least disruptive to customers. The LTS provides an essential storage buffer that ensures variations in demand across all sectors, throughout the day and throughout the year, can be supplied resiliently."

"World first" hydrogen research commences in Teesside

Research is now underway in Teesside that will collect key evidence about the suitability of the existing gas network to transport hydrogen as part of the H21 project.

On 22 April, Northern Gas Networks (NGN) announced that its study, using a network of existing natural gas mains to carry out standard operational procedures under 100% hydrogen conditions, had commenced. The evidence gathered will then be used to understand any changes needed for the potential conversion of the gas distribution network to transport clean hydrogen in the future.

The site being used is an area of disused land where 70 homes once stood and the gas pipes that supplied them remain intact though crucially, have been disconnected from the rest of the network. Two hydrogen boilers have also been installed as part of the project, connected to the network and the hydrogen odorised to smell the same as natural gas for the first time. NGN is set to spend several months at the site, gathering evidence and furthering understanding of a potential conversion of the gas network, before then restoring the site to its former state.

Neil Travers, H21 Project Manager for NGN, said that they believed the research to mark a "world first". Travers added: "There are many different procedures carried out on the gas network on a day-to-day basis and it's essential we understand how these may need to be adapted to ensure hydrogen can be delivered as safely and reliably as natural gas. Extensive research has already been completed off-grid but the difference at the South Bank is that we are using older gas mains, as are typical in many streets across the UK, for the first time."

easyJet links up with GKN Aerospace on hydrogen aviation

easyJet has joined forces with GKN Aerospace to collaborate on reducing carbon emissions in aviation through adopting zero carbon emission technologies.

On 28 April, easyJet announced that it will be supporting the development of GKN Aerospace's Hydrogen Combustion (H2JET) and Hydrogen Fuel Cell (H2GEAR) technology, including exploring options for flight demonstration. easyJet will also provide insights into operational requirements and economics.

GKN Aerospace is leading the collaborative H2GEAR programme, as it aims to develop a liquid hydrogen propulsion system for sub-regional aircraft, with the potential to be scaled up to larger aircraft in future. H2JET, meanwhile, is a Swedish collaborative two-year programme, also led by GKN Aerospace, which is striving to push the development of key subsystems for gas turbined-based hydrogen propulsion of medium range civil aircraft.

28 manufacturers sign up to switch to low carbon hydrogen

A group of 28 organisations have committed to switching to low carbon hydrogen produced and distributed in the Northwest as part of the HyNet industrial decarbonisation cluster.

On 14 April, HyNet announced that the likes of Kelloggs, PepsiCo and Jaguar LandRover have pledged to transition away from natural gas to locally-manufactured hydrogen. Having manufacturers that supply the UK with food, drink, consumer goods, metals, paper, cars, glass and chemicals commit to hydrogen was cited as a "vital move" for the UK's transition to a low carbon manufacturing sector, founded on secure, affordable UK clean energy.

Each company has signed a Memorandum of Understanding with the intent of receiving a future network connection and supply of hydrogen through HyNet infrastructure. There have already been demonstrations of switching from natural gas to hydrogen within the HyNet region, taking place at Pilkington Glass and Unilever, with further trials set to follow over the next two years across a range of industrial sectors.

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